Applications of a quality management system to task completion

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Introduction

A quality management system (QMS) is a set of processes and procedures designed to ensure consistent quality and meet customer or regulation requirements. Quality management is used in fields such as aerospace engineering to ensure plane parts meet quality standards (Lazur, Jagadeesh, Karthikeyan, & Shanmugaraja, 2013). Currently, there is nearly no presence of quality management in the field of task completion. Task registries such as the one recently set up on the Institute of Electrical and Electronics Engineers (IEEE) website provide for an opportunity to apply a QMS to task completion. The purpose of this project was to develop a QMS, and determine its effect on task application. Over the course of half of a year, a QMS was piloted and modified with the goal of helping people find a task online, and completing that task to the satisfaction of the customer. A null hypothesis was proposed that the application of quality management to task completion will have no effect on scores of task applications.

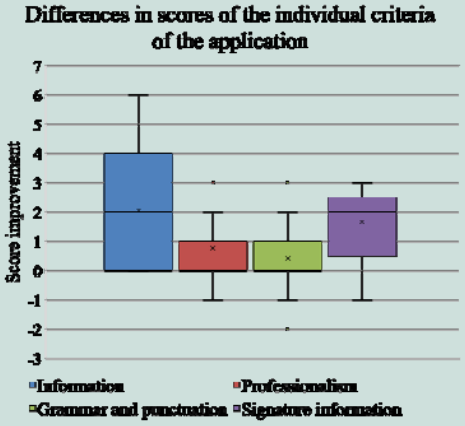
Materials and Methods

The first step was to develop and design a quality management system for task applications. That involved the determination of standards by which applications would be scored. Based on those standards, templates and examples of quality applications were developed. These materials comprised the QMS. In order to determine the effect of the QMS on application scores, 50 students initially applied for a task without introduction to the QMS. After an individual completed the application the first time, they then applied for another task with access to the QMS. After sending both the application with and without the QMS, a consistent grading rubric was used to score all applications on four specific criteria. Applicants received points for the information contained in the task application demonstrating their interpretation of the task. Points were awarded for professionalism, which was based on appropriate word choice and understanding of audience. The score also reflected correct use of grammar throughout the application. A score for signature information was based on personal and contact information provided by the applicant which was relevant to the task.

Results

In order to determine the impact of the quality management system on the participants, a Wilcoxon Signed-Rank Test was carried out using a 95% confidence interval comparing the two applications from each person. The test shows a *p*-value less than 0.0001, representing a statistical significance that people who used the QMS to assist them scored higher on their application than the application that was created without the QMS. The median improvement of the scores was 4.5, showing that people with the QMS scored on average 30% better on their application. On all trials the participants scored the same or better on the QMS aided application with a range of improvement from 0 points to 13 (Graph 1 below).

Graph 1 (Left): Box-and-whisker plot showing the distribution of the differences in scoring between the initial application, versus the application aided by a quality management system. A median of 4.5 points of improvement and no values showed a decrease in score from non-aided to QMS aided application.



Graph 2 (Right): Box-and-whisker plot for the individual criteria components that the application was graded on. Each criteria was worth 3 points, except for information, which was worth 6 total. Negative values represent a criteria that decreased between applications.

Conclusions

The goal of this project was to pilot one of the first quality management systems available for task completion, improve upon the design, and then test to see if the system was effective in increasing the quality of applications. Based on the results of the study, the null hypothesis was rejected, indicating that those who used the QMS for the process of applying to a task had a higher quality application than their application they made without quality management. Based on these findings, it can be concluded that those using a QMS to aid in the application process produced higher quality applications and consequently have a higher chance of acceptance.

Future research into the benefits of the entire QMS, from task acquisition to completion, could provide support for implementation into areas beyond task application. While only the application process was tested in this project, the full QMS encompasses the entire task completion process. This QMS is currently being turned into an online tutorial under an IEEE approved grant. The QMS developed can be used to increase overall quality of tasks completed, and consistently maintain that quality. Users that consistently demonstrate their ability to complete online tasks have the potential to experience increased opportunities such as acceptance into internships or jobs. Many businesses are hesitant to accept applicants without prior job experience, such as high school students, who are typically not seen as time and cost effective. By demonstrating competence and organization with a QMS, the quality that results could improve their chance of consideration for internships.

References

Lazur, B. I., Jagadeesh, L., Karthikeyan, B., & Shanmugaraja, M. (2013). An initiative to practice total quality management in aircraft maintenance. *Advances in Aerospace Science and Applications, 3*(2). Retrieved from http://www.ripublication.com/aasa/aasav3n2spl_06.pdf

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